I. Project Title: General Hydrology Support

II. Principal Investigator:

George Smith
P.O. Box 25486, Denver, Colorado 80225-0486
E-mail: george_smith@fws.gov
Phone: (303) 236-5322, ext. 235
Fax: (303) 236-4224

III. Project Summary:

The Service's Division of Water Resources provides basic hydrology support to Recovery Program researchers and undertakes tasks to support the Recovery Program in basic data collection and monitoring projects. Accomplishments during FY 2002 include: 1) collecting temperature data at 10 sites on the Green River and 4 sites on the Gunnison River, and assembling a temperature database for use by Recovery Program researchers; 2) coordinating contracting for Yampa River sediment monitoring; 3) providing technical hydrology support for a wide range of Recovery Program activities on a year-to-year basis; and 4) coordinating other Recovery Program efforts relating to hydrology and temperature analysis.

IV. Study Schedule: Initial Year - 1990, Final Year - Ongoing.

V. Relationship to RIPRAP: Colorado and Green rivers Action Plans I.
Provide and protect instream flows.

VI. Accomplishments of FY 2002 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

A. Temperature Data Collection

Temperature data collection during FY-2002 went well, no thermographs were stolen and very little data were lost from thermographs being out of the water at the lowest flow conditions since we began collecting temperature data in 1987. Because of low water conditions the thermographs at Juniper bridge and Craig on the Yampa River had problems in 2002 because the river is wide and gets very shallow during periods of low flows. To overcome this problem tether cables were extended so that the thermographs could be relocated to a deeper part of the channel. Additional thermographs were placed at several other locations which have a low flow channel that is accessible for the river bank.

Some additional time was spent in FY 2002 providing data to John Carron of Hydrosphere. Work included retrieving data reformatting data and transmitting data. Routine temperature data continued in 2002 along with preparing the 2002 for archiving and publishing on the web. The yearly process includes downloading data in the field in March, July, and October, graphically plotting the data and visually checking the data and preparing presentation quality graphs using Excel spreadsheets. The spreadsheets are then web enabled and linked to the River data Web page. The temperature data can be accessed and downloaded from the River data Web page at http://www.r6.fws.gov/riverdata/ or by email request from FWS Division of Water Resources (address above). A photo was included on the web page to display the general location of each thermograph. GPS location for each thermograph is available by request, for security purposes the exact locations are not provided on the web page. We also continued organizing the temperature data collected since 1987.

A new temperature monitoring project got underway in 2001 and continued in 2002 to monitor real-time water temperatures at Echo Park above and below the confluences of the Yampa and Green rivers. After investigation of cost associated with purchasing equipment to monitor and transmit data out of Echo Park it was determined that the budget for the project was only sufficient to purchase equipment for one real-time monitoring station and four stations were needed. This development was brought to the attention of the Flaming Gorge work team and Recovery Program staff and a decision was made to scale back the project and try to accomplish the same objective by adding real-time temperature monitoring to the Deerlodge Park USGS gage and to add a USGS temperature gage at the Gates of Lodore. The equipment for the gages was purchased by Wyoming using funding which usually is earmarked for the Division of Water Resources out of Wyoming annual contribution to the Recovery Program. The equipment was ordered in September, permits were obtained from Dinosaur National Monument, and all the equipment was installed in the spring of 2002 prior to spring runoff.

The Grand Junction CRFP office currently maintains thermograph at six locations on the Colorado River and one on the Gunnison River. Current installation protocol calls for two thermograph to be deployed at separate but relatively nearby locations so that backup data will be available if one should be lost or stolen. Older Ryan thermographs have been phased out and replaced by the newer, cheaper, Onset Tidbit devices. Thermograph data is downloaded either annually or biannually, unfortunately the Grand Junction CRFP is behind on converting the raw 2-hour interval data into daily means. In 2001 and 2002, the Grand Junction CRFP
office has made an effort to become caught up with this and substantial progress was made in 2002 but, there is still a ways to go.

B. Hydrology Support for Biological Opinions

The Division of Water Resources monitored endangered fish releases from Flaming Gorge, Ruedi, and the Aspinall Unit during the spring runoff and post runoff period. The interest of the Recovery Program was represented at the quarterly operational meetings, where input was provided on flow patterns and protection of water for endangered fish. The Division of Water Resources also provided support to researchers working on flow recommendations and related reports. Specific work accomplished is addressed under the appropriate work task below.

Green River: Attended Meetings of the Flaming Gorge Work Group and represented the Recovery Program at a public information meeting held in Rock Springs, Wyoming.

Gunnison River: The Division of Water Resources continued to provide support in developing data for the synthesis, and worked with Chuck McAda in resolving issues identified in the minority report. Coordinated peers review of Gunnison River scopes of work for Geomorphology work.

Colorado River Programmatic Biological Opinion: Worked with Recovery Program staff to set up procedures and accounting methods for tracking depletions under the Colorado River Programmatic Opinion.

C. Hydrology Support for Development of Flow Recommendations

Considerable work was undertaken to complete the review and development of the final draft of the Green/Yampa river Sediment Study. Work included review of preliminary drafts, circulation of the draft for peer review and working with the author to address peer review comments.

Yampa River Operation and Management Plan: The Division of Water Resources provided assistance to the Program Director's Office by coordinating meetings, developing scopes of work for gaging, hydrology model review, and developing annual project reports. The Division of Water Resources also supported the Yampa Plan by reviewing documents and attending Hydrology work group meetings.

VII. Recommendations:

The work provided is, for the most part, in support of other research projects or activities such as flow delivery, flow quantification, and habitat restoration, all of which have a direct impact on the recovery of the Colorado River endangered fish. The direct quantification of the success of many of the activities is difficult because most of the activities are long-term in nature.

VIII. Project Status: Ongoing and on-track.

IX. FY 2002 Budget Status:

A. Funds provided: $ 77900
B. Funds expended: $ 77900
C. Difference: $ 0

X. Status of Data Submission: Not applicable.

XI. Signed: *George Smith* December 10, 2002
Principal Investigator Date:

APPENDIX: Reports, the temperature data collection, and database for water year 2002 are placed on the Recovery Program's Home Page for access by researchers by December 31, 2002.

I:\COLORIV\2002 Annual Reports\INSTREAM FLOW\2002 Water Acquisition Annual Reports for\2002 Annual Report, Project Number 19b, General Hydrology Support.wpd